

What is claimed is:

1 1. An electret comprising a first polymer
2 copolymerizing from monomers comprising:

3 VdF as a first monomer; and

4 HFP, CTFE, TFE, or combinations thereof as a second
5 monomer.

1 2. The electret in claim 1, wherein the content of
2 VdF in the first polymer is between 10 mole% and 80 mole%.

1 3. The electret in claim 1, wherein the content of
2 HFP in the first polymer is approximately 30 mole% or less.

1 4. The electret in claim 1, wherein the content of
2 CTFE in the first polymer is approximately 30 mole% or less.

1 5. The electret in claim 1, wherein the content of
2 TFE in the first polymer is approximately 40 mole% or less.

1 6. The electret in claim 1, wherein the monomers
2 further comprise a third monomer comprising cyclohexyl vinyl
3 ether, 4-hydroxybutyl vinyl ether, ethyl vinyl ether, methyl
4 methacrylate, butyl acrylate, 4-hydroxyl ethyl
5 methacrylamide, glyceryl methacrylamide, acrolein, butyl
6 vinyl ether, propionic vinyl ether, α,α -dimethylpropionic
7 vinyl ether, or combinations thereof.

1 7. The electret in claim 6, wherein the content of
2 the third monomer in the first polymer is approximately 30
3 mole% or less.

1 8. The electret as claimed in claim 1, wherein the
2 content of fluorine element in the first polymer is between
3 60 and 76 wt%.

1 9. The electret in claim 1, wherein the electret is
2 porous material.

1 10. The electret in claim 9, wherein the electret is
2 porosified by solvent, supercritical fluid, or thermal
3 decomposition.

1 11. The electret in claim 1, further comprising a
2 second polymer mixed with the first polymer, the second
3 polymer comprising polymethacrylate, polyvinyl acetate,
4 polycarbonate, polyurethane, polyester, polyimide,
5 poly(butylene terephthalate), or polystyrene.

1 12. The electret in claim 11, wherein the content of
2 the second polymer therein is approximately 60 wt% or less.

1 13. The electret in claim 1, wherein the electret is
2 soluble in ethyl acetate, acetone, methyl ethyl ketone,
3 methyl isobutyl ketone, 1-methyl-2-pyrrolidone, dimethyl
4 sulfoxide, dimethylformamide, or combinations thereof.

1 14. The electret in claim 1, wherein initial surface
2 potential thereof is between 1350 and 2950V when polarized
3 by corona discharge under potential difference approximately
4 of 18KV.

1 15. The electret in claim 14, wherein a surface
2 potential thereof is 12 to 55% of the initial surface

3 potential at room temperature for approximately 10 days from
4 polarization.

1 16. The electret in claim 9, wherein initial surface
2 potential thereof is between 2820 and 2950V when polarized
3 by corona discharge under potential difference of
4 approximately 18KV.

1 17. The electret in claim 1, wherein a surface
2 potential thereof is 50 to 55% of the initial surface
3 potential at room temperature for approximately 10 days from
4 polarization.

1 18. An electret composite, comprising:
2 a substrate; and
3 an electret coated on the substrate, the electret
4 having a first polymer copolymerizing from
5 monomers having VdF as a first monomer, and HFP,
6 CTFE, TFE, or combinations thereof as a second
7 monomer.

1 19. The composite as claimed in claim 18, wherein the
2 substrate comprises polyethylene, polypropylene,
3 poly(butylene terephthalate), polytetrafluoroethylene,
4 poly(tetrafluoroethylene/ethylene), or polystyrene.

1 20. The composite as claimed in claim 19, wherein the
2 substrate is film, plate, or, nonwoven or woven fiber.

1 21. The composite as claimed in claim 18, wherein the
2 content of VdF in the first polymer is between 10 mole% and
3 80 mole%.

1 22. The composite as claimed in claim 18, wherein the
2 content of HFP in the first polymer is approximately 30
3 mole% or less.

1 23. The composite as claimed in claim 18, wherein the
2 content of CTFE in the first polymer is approximately 30
3 mole% or less.

1 24. The composite as claimed in claim 18, wherein the
2 content of TFE in the first polymer is approximately 40
3 mole% or less.

1 25. The composite as claimed in claim 18, wherein the
2 monomers further comprise a third monomer comprising
3 cyclohexyl vinyl ether, 4-hydroxybutyl vinyl ether, ethyl
4 vinyl ether, methyl methacrylate, butyl acrylate, 2-hydroxy
5 ethyl methacrylamide, glyceryl methacrylamide, acrolein,
6 butyl vinyl ether, propionic vinyl ether, α,α -
7 dimethylpropionic vinyl ether, or combinations thereof.

1 26. The composite as claimed in claim 25, wherein the
2 content of the third monomer in the first polymer is
3 approximately 30 mole% or less.

1 27. The composite as claimed in claim 18, wherein the
2 content of fluorine element in the first polymer is between
3 60 and 76 wt%.

1 28. The composite as claimed in claim 18, wherein the
2 electret further comprises a second polymer mixed with the
3 first polymer, the second polymer comprising
4 polymethacrylate, polyvinyl acetate, polycarbonate,

5 polyurethane, polyester, polyimide, poly(butylene
6 terephthalate), or polystyrene.

1 29. The composite as claimed in claim 28, wherein the
2 content of second polymer in the electret is approximately
3 60 wt% or less.

1 30. The composite as claimed in claim 18, wherein the
2 electret is porous material.

1 31. The composite as claimed in claim 18, wherein the
2 electret is porosified by solvent, supercritical fluid, or
3 thermal decomposition.

1 32. The composite as claimed in claim 18, wherein the
2 substrate is coated with the electret by a solvent or direct
3 heating method.

1 33. The composite as claimed in claim 32, wherein
2 solvent used in the solvent process is acetone, methyl ethyl
3 ketone, methyl isobutyl ketone, 1-methyl-2-pyrrolidone,
4 dimethyl sulfoxide, dimethylformamide, or combinations
5 thereof.

1 34. The composite as claimed in claim 33, wherein the
2 solvent process further comprises impregnation, spraying, or
3 spin-coating.

1 35. The composite as claimed in claim 18, wherein
2 initial surface potential of the electret is between 1350
3 and 2950V when polarized by corona discharge under potential
4 difference of approximately 18KV.

1 36. The composite as claimed in claim 35, wherein a
2 surface potential of the electret is 12 to 55 percents of
3 the initial surface potential when standing at room
4 temperature for approximately 10 days from polarization.

1 37. The composite as claimed in claim 31, wherein
2 initial surface potential of the electret is between 2820
3 and 2950V when polarized by corona discharge under potential
4 difference of approximately 18KV.

1 38. The composite as claimed in claim 31, wherein a
2 surface potential of the electret is 50 to 55% of the
3 initial surface potential at room temperature for
4 approximately 10 days from polarization.

1 39. An electret composite, comprising:
2 a porous substrate; and
3 an electret coated on the substrate along the profile
4 thereof, the electret having a first polymer
5 copolymerizing from monomers having VdF as a
6 first monomer, and HFP, CTFE, TFE, or
7 combinations thereof as a second monomer.

1 40. The composite as claimed in claim 39, wherein the
2 substrate comprises a nonwoven or woven fabric of
3 polyethylene terephthalate, polyethylene, polypropylene,
4 polytetrafluoroethylene, polystyrene, or polyvinyl chloride.

1 41. The composite as claimed in claim 39, wherein the
2 content of VdF in the first polymer is between 10 mole% and
3 80 mole%.

1 42. The composite as claimed in claim 39, wherein the
2 content of HFP in the first polymer is approximately 30
3 mole% or less.

1 43. The composite as claimed in claim 39, wherein the
2 content of CTFE in the first polymer is approximately 30
3 mole% or less.

1 44. The composite as claimed in claim 39, wherein the
2 content of TFE in the first polymer is approximately 40
3 mole% or less.

1 45. The composite as claimed in claim 39, wherein the
2 monomers further comprise a third monomer comprising
3 cyclohexyl vinyl ether, 4-hydroxybutyl vinyl ether, ethyl
4 vinyl ether, methyl methacrylate, butyl acrylate, 4-hydroxyl
5 ethyl methacrylamide, glyceryl methacrylamide, acrolein,
6 butyl vinyl ether, propionic vinyl ether, α,α -
7 dimethylpropionic vinyl ether, or combinations thereof.

1 46. The composite as claimed in claim 45, wherein the
2 content of the third monomer in the first polymer is
3 approximately 30 mole% or less.

1 47. The composite as claimed in claim 39, wherein the
2 content of fluorine element in the first polymer is between
3 60 and 76 wt%.

1 48. The composite as claimed in claim 39, wherein the
2 electret further comprises a second polymer mixed with the
3 first polymer, the second polymer comprising
4 polymethacrylate, polyvinyl acetate, polycarbonate,

5 polyurethane, polyester, polyimide, poly(butylene
6 terephthalate), or polystyrene.

1 49. The composite as claimed in claim 39, wherein the
2 content of second polymer in the electret is approximately
3 60 wt% or less.

1 50. The composite as claimed in claim 39, wherein the
2 substrate is coated by dissolving the electret in acetone,
3 methyl ethyl ketone, methyl isobutyl ketone, 1-methyl-2-
4 pyrrolidone, dimethyl sulfoxide, dimethylformamide, or
5 combinations thereof to form a solution, immersing the
6 substrate in the solution, taking the substrate from the
7 solution, and evaporating the solution therefrom.

1 51. The composite as claimed in claim 39, wherein a
2 initial surface potential of the electret is between 2820
3 and 2950V when polarized by corona discharge under potential
4 difference approximately 18KV.

1 52. The composite as claimed in claim 51, wherein a
2 surface potential of the electret is 50 to 55% of the
3 initial surface potential at room temperature for
4 approximately 10 days from polarization.